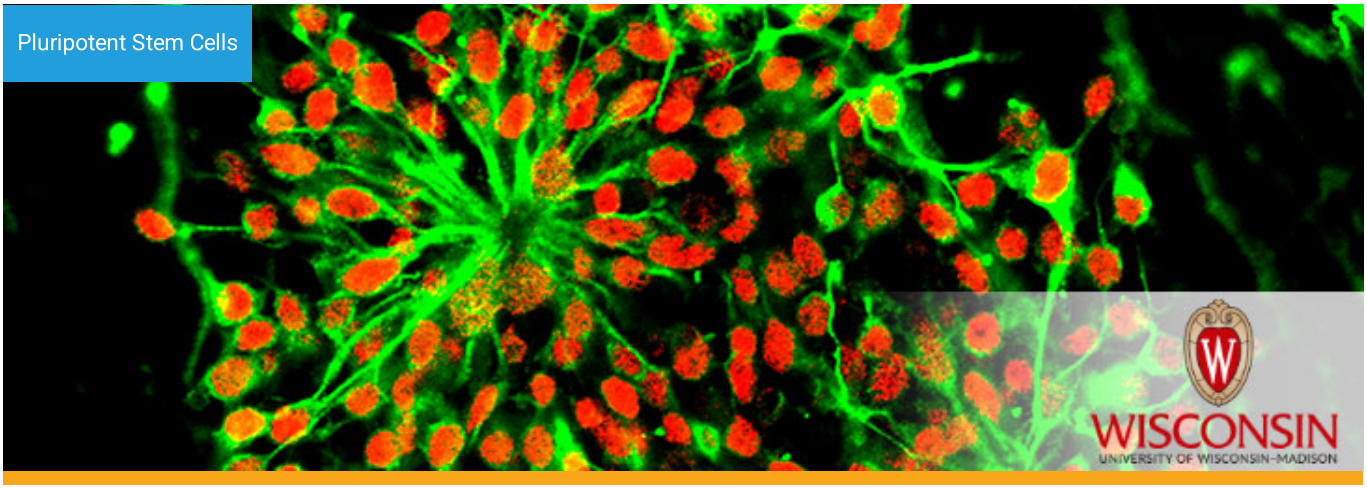

Xenogen-Free Culture Medium for Stem Cells

View U.S. Patent No. 9,938,499 in PDF format.

WARF: P130178US02

Inventors: Igor Slukvin, Gene Uenishi

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method to differentiate human pluripotent stem cells to endothelial and blood lineage cells using serum- and xenogen-free medium.

Overview

With the advent of human pluripotent stem cell technologies, endothelial and blood lineage (hematopoietic) cells can be produced *in vitro* for functional studies and therapies. Efficient differentiation of these cells has traditionally relied on co-culture with mouse stromal cells such as OP9, and the use of serum or non-human (xenogenic) protein-containing media.

However, such culture systems have limited utility for studying stem cell response to specific growth factors and they constrict the manufacture of clinical grade therapeutic blood cells.

Given these shortcomings, a new culture system is needed that avoids non-human contamination risks and can provide endothelial/blood lineage cells suitable for clinical applications.

The Invention

UW–Madison researchers have developed a chemically defined, xenogen-free culture system for differentiating human pluripotent stem cells into mesoderm, endothelial and hematopoietic progenitor cells. The new culture system can be used to produce these types of cells from human pluripotent stem cells growing in completely defined E8 medium, thus providing an opportunity to manufacture clinical grade cells.

In the new method, the stem cells (human embryonic or human induced pluripotent stem cells) are seeded as a single cell suspension on a substrate comprising a layer of Tenascin C and IF9S culture medium supplemented with BMP4, Activin A, FGF2 and LiCl. The medium also comprises various hematopoietic cytokines. The stem cells are exposed to the mixture under hypoxic conditions for about two days.

Applications

- Differentiating human pluripotent stem cells (hESC or HiPSC)
- Providing endothelial and hematopoietic cell populations
- Functional studies and clinical therapy

Key Benefits

- Chemically defined and serum free
- Cells not exposed to non-human constituents
- As effective as OP9 protocols
- Avoids embryoid body formation

Stage of Development

The researchers have defined the factors and concentrations required to replace OP9 co-culture methods.

Additional Information

For More Information About the Inventors

- Igor Slukvin

Related Technologies

- WARF reference number P06082US describes a population of cells that comprise unique, multipotent lymphohematopoietic progenitors.

Tech Fields

- Pluripotent Stem Cells : Differentiation

For current licensing status, please contact Andy DeTienne at adetienne@warf.org or 608-960-9857